

SEP - 6 2001

Nichols Institute Diagnostics  
Advantage Direct Renin 510(k)  
Last updated: April 09, 2001

K011128

## 11.0 510(k) Summary of Safety and Effectiveness

*This summary of safety and effectiveness is being submitted in accordance with the requirements of SMDA 1990 and 21 CFR 807.92.*

### 1. Name of Manufacturer, Contact Person and Date Summary Prepared:

Quest Nichols Institute Diagnostics  
33051 Calle Aviator  
San Juan Capistrano, CA 92675  
Phone: 949-240-5260  
FAX: 949-240-5313  
Contact Person: Jimmy Wong, Manager of Clinical and Technical Affairs  
Date Prepared: April 2, 2001

2. **Device Name:** Nichols Advantage Direct Renin  
**Analyte:** Renin Immunoassay  
**Classification Name:** Angiotensin I and renin test system.
3. **Classification:** Class II  
Regulation Number: 862.1085  
Product Code: CIB, Clinical Chemistry
4. **Device Description:**

The Advantage Direct Renin has sufficient reagents for 100 tests. The renin assay is an immunochemiluminometric assay utilizing a biotinylated monoclonal antibody as capture, and an acridinium-ester labeled monoclonal antibody for signal. The assay incubates at 37°C for a total of 30 minutes. During incubation, plasma renin is sandwiched between the two monoclonal antibodies. Because of the high affinity between biotin and streptavidin, the captured sandwich complex binds to avidin-coated magnetic particles. Free biotinylated antibody and acridinium labeled antibody are separated from the complex bound to the magnetic particles by aspiration of the reaction mixture and subsequent washing in the Nichols Advantage Specialty System. The wells containing the washed magnetic particles are moved to the luminometer, which automatically injects Trigger 1 and 2, initiating the chemiluminescence reaction. The light is quantified by the luminometer and expressed in relative light units (RLU). The amount of acridinium labeled antibody bound is directly proportional to the concentration of renin in the sample. The concentration of renin is determined directly from a generated stored master curve.

### 5. Intended Use:

The Nichols Advantage Renin is an immunometric assay for the quantitative measurement of renin in human plasma. Renin measurements are used in the diagnosis and treatment of certain types of hypertension.

### 6. Comparison to Predicate Device:

The Nichols Advantage Renin (X) is substantially equivalent to the Nichols Institute Diagnostics Active Renin Irma (Y), another product in commercial distribution with similar intended use. To demonstrate substantial equivalence, a method comparison study was performed on n=107 plasma samples spanning the reportable range of each assay following the NCCLS EP9-A guidelines. The range of results observed with the Advantage Renin ranged from 1.5 µU/mL to 441 µU/mL. Corresponding results with the Active Renin Irma ranged from 6.8-464 µU/mL. Linear regression analysis was applied to these samples, yielding an agreement of  $Y = 0.87x - 1.9$ , with a Pearson

correlation of  $r=0.95$ . The 95% confidence interval for the slope was 0.81 to 0.92, and the 95% confidence interval for the intercept was -7.4 to 3.6  $\mu\text{U/mL}$ .

#### 7. Similarities to Predicate Device

	Advantage Direct Renin	Active Renin IRMA
Monoclonal antibodies and detection technology	Same	Same
Sample Size;	0.2 mL EDTA plasma	0.2 mL EDTA plasma
Inter-Assay Precision	2.0-10.0% CV	4.4-9.9% CV
Parallelism:	94-111% recovery	83-99% recovery
Recovery:	98-107%	87-106%
Calibration	WHO IRP 68/356	WHO IRP 68/356

#### 8. Differences from Predicate Device

	Advantage Direct Renin	Active Renin IRMA
Incubation	30 minutes at 37°C	24±2 hours at 15-25°C
Sensitivity	0.8 $\mu\text{U/mL}$	1.4 $\mu\text{U/mL}$
Automation	Yes	No
Reference Range	Supine: 2.4-29 $\mu\text{U/mL}$ Upright: 3.3-41 $\mu\text{U/mL}$	Supine: 5-47 $\mu\text{U/mL}$ Upright: 7-76 $\mu\text{U/mL}$
Analytical range	0-500 $\mu\text{U/mL}$	0-2000 $\mu\text{U/mL}$



DEPARTMENT OF HEALTH & HUMAN SERVICES

Food and Drug Administration  
2098 Gaither Road  
Rockville MD 20850

SEP - 6 2001

Mr. Jimmy Wong  
Manager, Clinical and Technical Affairs  
Nichols Institute Diagnostics  
33051 Calle Aviador  
San Juan Capistrano, CA 92675

Re: K011128  
Trade/Device Name: Nichols Advantage Direct Renin  
Regulation Number: 21 CFR 862.1085, 862.1150  
Regulatory Class: II  
Product Code: CIB, JIT  
Regulatory Class: I, reserved  
Product Code: JJX  
Dated: August 3, 2001  
Received: August 8, 2001

Dear Mr. Wong:

We have reviewed your Section 510(k) notification of intent to market the device referenced above and we have determined the device is substantially equivalent to devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration.

If your device is classified (see above) into either class II (Special Controls) or class III (Premarket Approval), it may be subject to such additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 895.

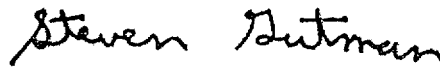
A substantially equivalent determination assumes compliance with the Good Manufacturing Practice for Medical Devices: General (GMP) regulation (21 CFR Part 820) and that, through periodic GMP inspections, the Food and Drug Administration (FDA) will verify such assumptions. Failure to comply with the GMP regulation may result in regulatory action. In addition, FDA may publish further announcements concerning your device in the Federal Register. Please note: this response to your premarket notification submission does not affect any obligation you might have under sections 531 through 542 of the Act for devices under the Electronic Product Radiation Control provisions, or other Federal laws or regulations.

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This letter will allow you to begin marketing your device as described in your 510(k) premarket notification. The FDA finding of substantial equivalence of your device to a legally marketed predicate device results in a classification for your device and thus, permits your device to proceed to the market.

If you desire specific advice for your device on our labeling regulation (21 CFR Part 801 and additionally 809.10 for in vitro diagnostic devices), please contact the Office of Compliance at (301) 594-4588. Additionally, for questions on the promotion and advertising of your device, please contact the Office of Compliance at (301) 594-4639. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21CFR 807.97). Other general information on your responsibilities under the Act may be obtained from the Division of Small Manufacturers International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 443-6597 or at its internet address "<http://www.fda.gov/cdrh/dsma/dsmamain.html>".

Sincerely yours,

A handwritten signature in black ink that reads "Steven Gutman". The signature is written in a cursive, flowing style.

Steven I. Gutman, M.D., M.B.A.  
Director  
Division of Clinical Laboratory Devices  
Office of Device Evaluation  
Center for Devices and  
Radiological Health

Enclosure

**4.0 Indications For Use Statement**

**INDICATIONS FOR USE STATEMENT**

510(k) Number K011128

Device Name: Nichols Advantage Direct Renin

**Indications for Use Statement:** The Nichols Advantage Direct Renin is an immunometric assay for the quantitative measurement of renin in human plasma. Renin measurements are used in the diagnosis and treatment of certain types of hypertension.

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**Concurrence of CDRH, Office of Device Evaluation (ODE)**

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☒ **Prescription Use**  
(Per 21 CFR 801.109)

Or

**Over-The-Counter Use**  
(Optional Format 1-2-96)

Kesia Alexander for Joan Cooper  
(Division Sign-Off)  
Division of Clinical Laboratory Devices  
510(k) Number K011128